WHAT IS CLAIMED IS:

1. A field-effect transistor comprising a Group III nitride semiconductor layer structure including a heterojunction, a source electrode and a drain electrode formed on the semiconductor layer structure while being separated from each other, a gate electrode arranged between said source electrode and said drain electrode, and an insulating film formed on said Group III nitride semiconductor layer,

wherein, said gate electrode has a field plate portion formed on said insulating film while said field plate portion overhanging said drain electrode side in a visored shape, and said insulating film is a multilayered film including a first insulating film and a second insulating film, said first insulating film being made of a compound containing silicon and nitrogen as constituent elements, said second insulating film having a dielectric constant lower than that of said first insulating film.

2. A field-effect transistor according to claim 1, wherein, second insulating film is laminated on said first insulating film.

3. A field-effect transistor according to claims 1 or 2, wherein, the thickness of said first insulating film is not more than 150 nm.

4. A field-effect transistor according to any one of claims 1 to 3, wherein, a dielectric constant of said second insulating film is not more than 3.5.

5. A field-effect transistor according to any one of claims 1 to 4, wherein, said insulating film including a multilayered film is formed while being separated from said gate electrode, the multilayered film having said first insulating film and said second insulating film, and said second insulating film is provided between said insulating film and said gate electrode.

6. A field-effect transistor according to claim 5, wherein, said second insulating film provided between said insulating film and said gate electrode is positioned below said field plate portion, and

said insulating film formed by the multilayered film including said first insulating film and said second insulating film is positioned between a drain-side end portion of said field plate portion and said drain electrode.

7. A field-effect transistor according to any one of claims 1 to 6, further comprising a third insulating film on said second insulating film, the third insulating film being made of a compound containing silicon and nitrogen as the constituent elements.

8. A field-effect transistor comprising a Group III nitride semiconductor layer structure including a heterojunction, a source electrode and a drain electrode formed on the semiconductor layer structure while being separated from each other, a gate electrode arranged between said source electrode and said drain electrode, and an insulating film formed on said Group III nitride semiconductor layer,

wherein, said gate electrode has a field plate portion formed on said insulating film while said field plate portion overhanging said drain electrode side in a visored shape, and said insulating film is made of a compound containing silicon, nitrogen, and oxygen as constituent elements.

9. A field-effect transistor comprising a Group III nitride semiconductor layer structure including a heterojunction, a source electrode and a drain electrode formed on the semiconductor layer structure while being separated from each other, a gate electrode arranged between said source electrode and said drain electrode, and an insulating film formed on said Group III nitride semiconductor layer,

wherein, said gate electrode has a field plate portion formed on said insulating film while said field plate portion overhanging said drain electrode side in a visored shape, and said insulating film has dielectric constants not more than 3.5.

10. A field-effect transistor comprising a Group III nitride

semiconductor layer structure including a heterojunction, a source electrode and a drain electrode formed on the semiconductor layer structure while being separated from each other, a gate electrode arranged between said source electrode and said drain electrode, and an insulating film formed on said Group III nitride semiconductor layer,

wherein, said gate electrode has a field plate portion formed on said insulating film while said field plate portion overhanging said drain electrode side in a visored shape, and said gate electrode side of said insulating film is made of an insulating material having dielectric constants not more than 4 and said drain electrode side of said insulating film is made of an insulating material containing silicon and nitrogen as constituent elements.

11. A field-effect transistor according to claim 10, wherein, said drain electrode side of said insulating film is made of an insulating material containing silicon, nitrogen, and oxygen as the constituent elements.

12. A field-effect transistor comprising a Group III nitride semiconductor layer structure including a heterojunction, a source electrode and a drain electrode formed on the semiconductor layer structure while being separated from each other, a gate electrode arranged between said source electrode and said drain electrode, and an insulating film formed on said Group III nitride semiconductor layer,

wherein, said gate electrode has a field plate portion formed on said insulating film while said field plate portion overhanging said drain electrode side in a visored shape, and said drain electrode side is lower than said gate electrode side in a dielectric constant of a capacity formed by said field plate portion, said Group III nitride semiconductor layer, and said insulating film sandwiched therebetween.

13. A field-effect transistor according to claim 12, wherein, a part of said insulating film is a multilayered film including a first insulating film and a second insulating film, said first insulating film being made of a compound containing silicon and nitrogen as constituent elements, said second insulating film having a dielectric constant lower than that of said first insulating film, and said gate electrode side is formed by a single-layer film of the first insulating film and said drain electrode side is formed by the multilayered film including said first insulating film and said second insulating film in said insulating film between said field plate portion and a surface of said semiconductor layer structure.

14. A field-effect transistor according to any one of claims 1 to 13, wherein, said semiconductor layer structure includes a channel layer made of $In_xGa_{1-x}N$ ($0 \leq x \leq 1$) and an electron supply layer made of $Al_yGa_{1-y}N$ ($0 < y \leq 1$).

15. A field-effect transistor according to any one of claims 1 to 14, wherein, contact layers are arranged between said source electrode and a surface of said semiconductor layer structure and between said drain electrode and a surface of said semiconductor layer structure, respectively.

16. A field-effect transistor according to claim 15, wherein, said contact layer is formed by an undoped AlGaN layer.

17. A field-effect transistor according to claim 16, wherein, said field plate portion extends to an upper portion of said contact layer.

18. A field-effect transistor according to any one of claims 1 to 17, wherein, said semiconductor layer structure has a structure in which the channel layer made of $In_xGa_{1-x}N$ ($0 \leq x \leq 1$), the electron supply layer made of $Al_yGa_{1-y}N$ ($0 < y \leq 1$), and a cap layer made of GaN are sequentially laminated.